

The Genus *Quartinia* Ed. André, 1884 (Hymenoptera: Vespidae: Masarinae) in Southern Africa. Part I. Descriptions of New Species with Complete Venation

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Abstract.—In this publication, the first of a projected series revising the Afrotropical (essentially southern African) species of the genus *Quartinia* Ed. André, 1884 (Hymenoptera: Vespidae, Masarinae), eleven new species are described. Of these, seven occurring variously in the southern Namib Desert and in its southward extension down the western coast of South Africa, and one occurring on the southern coast of South Africa, have been found nesting in sand-filled snail shells. They are: *australis*, *bonaespei*, *conchicola*, *namaqua*, *namaquensis*, *obibensis*, and *refugicola*. To these species is added *vexillata* which is presumed to have the same nesting habits. A key to distinguish these species is given. The other three newly described species, all from Namibia, are: *femorata*, *geigeriae* and *lamellata*.

Following van der Vecht and Carpenter (1990) *Quartinia* Ed. André, 1884 is here understood to include, as junior subjective synonyms, *Quartiniella* Schulthess, 1929 and *Quartinioides* Richards, 1962.

As has been pointed out by Carpenter (2001), *Quartiniella* and *Quartinioides* were primarily based on the partitioning of a trend in the reduction of wing venation, *Quartiniella* being defined on the basis of the loss of *3rs-m* and *2m-cu* and *Quartinioides* because it has *2m-cu* present but attenuate and interrupted, whereas *Quartinia* has it complete. In *Quartiniella* in particular and to some extent also in *Quartinioides* reduction of wing venation is a correlate of overall size reduction. As formal taxonomic partitioning of essentially continuous variation is an unacceptable practice, Carpenter synonymized *Quartiniella* and *Quartinioides* with *Quartinia*, a view with which the present author is in full agreement.

Nevertheless, in view of the large number of species in *Quartinia*, adoption of the above venational characters to divide the genus into smaller, more manageable but

totally informal, non-natural units is found to be useful. Thus the present paper deals with species with complete venation – that is species which in the past would have been placed in *Quartinia sensu stricto*.

In his revision Richards (1962) dealt with a total of 61 southern African species, 18 being placed in *Quartinia*, 38 in *Quartinioides* and five in *Quartiniella*. Of these, 11, 26 and two respectively were described as new. One additional species, placed in *Quartinioides* was added (Richards 1982). Available to Richards in 1962 were just over one thousand specimens – 140 *Quartinia*, 727 *Quartinioides* and 148 *Quartiniella*. Ten species were known from only one specimen, 30 species from only one sex. It is clear that Richards suffered from a paucity of material. Particularly the lack of large samples from individual populations spread over the distributional area prevented him from appreciating factors such as intraspecific variation and geographical clines. In some instances the associations of sexes is of doubtful validity, especially where males and females are from widely separated localities.

The present study is based on over 6000 specimens, most of which were purposefully collected. A large proportion of the specimens have associated biological data – mostly flower visiting records but also, for some species, nesting data.

Desirable as it might be to undertake a complete revision of the genus, this is at present not practicable. Rather than to get bogged down in a study which might never be completed and published, it is intended to publish a series of papers describing new species as well as reviewing some known species. It is envisioned that a new key to species will complete the series.

Quartinia species range in length from a little over 2 mm to 7 mm. In comparison with the great majority of species of other genera of Masarinae even the largest *Quartinia* are relatively small. In view of the considerable range in size shown by species of *Quartinia* and in order to express relative size, categories based on length have been established for species of the genus. These are: minute (1.5–2.5 mm); small (2.5–3.5 mm); medium (3.5–4.5 mm); large (4.5–5.5 mm); very large (5.5–6.5 mm); and gigantic (6.5–7.5 mm).

The notation used for expressing geographic co-ordinates is as in the gazetteer of *The Times Atlas of the World* (1981). The figures before the stop are degrees, those after the stop are minutes; the stop is **not** a decimal point.

For purposes of plotting distributions, co-ordinates have been given in square brackets in the text for those localities for which none are given on the data labels.

On a few data labels from collections other than that of the Albany Museum the collecting locality is followed by degree latitude and degree longitude and by half- and quarter-degree reference letters according to the Degree Reference System of Leistner and Morris (1976). As this system is not universally understood an attempt has been made here to find on a map the localities concerned and to add

in square brackets the co-ordinates expressed in the manner adopted in this paper.

In listing the material examined, the localities have been arranged, as far as practicable, in north to south order within countries or, in the case of South Africa, within provinces.

Acronyms for institutions in which material is housed are: AMG = Albany Museum, Grahamstown, South Africa; CAS = California Academy of Sciences, San Francisco, United States of America; FSCA = Florida State Collection of Arthropods, Gainesville, United States of America; NCP = National Collection of Insects, Pretoria, South Africa; NNIC = Namibian National Insect Collection, Windhoek, Namibia.

DESCRIPTION OF SPECIES AND COLLECTION DATA

A) Species nesting in sand-filled snail shells or (*vexillata*) presumed to do so.

Quartinia australis Gess, new species

Diagnosis.—Large (5.0–5.4 mm). Fore wing with *Cu*₁ and *2m-cu* complete and as thick as the other veins. Tegula with posterior inner corner inwardly produced. Both sexes predominantly black with limited white markings; male with clypeal disc and underside of scape and pedicel white.

Description.—*Female*: Black. The following are white: narrow anterior margin of pronotum (in most specimens) and extreme postero-dorsal angle of same; tegula anteriorly and posteriorly; lateral lamella of scutellum; posterior bands medially on terga I–V (that on V in some specimens reduced to a postero-medial spot); distal end of fore femur; streaks on fore and middle tibiae; proximal and distal ends of hind tibia. Brown are: rest of legs; underside of flagellum. Wings lightly browned.

Length 5.0–5.4 (average of 5:5.3 mm); length of fore wing 3.4–3.6 mm (average of 4:3.53 mm); hamuli 6.

Head in front view $1.31 \times$ as wide as long, finely microreticulate, matt; clypeus apunctate; frons and vertex with shallow punctures separated by about their width (punctures barely perceivable on lower regions of frons, clearer in ocular sinuses and upper part of frons and particularly on vertex. POL:OOL = 1:0.6. Clypeus $1.5 \times$ as wide as long; anterior margin shallowly and widely emarginate; antero-lateral angles rounded.

Mesosoma microreticulate, moderately shiny, with punctures larger and more obvious than on head.

Gaster microreticulate but shiny; punctures finer and shallower than on head and much more so than those on mesosoma, becoming progressively finer posteriorly.

Male: Black. White markings as in female, with in addition: labrum; disc of clypeus (i.e. not sides nor areas adjacent to antennal sockets); underside of scape and pedicel; posterior band on tergum VI; distal end of middle and hind femora. Underside of flagellum white suffused with reddish-brown.

Length 5.0–5.4 (average of 4.51 mm); length of front wing 3.4–3.6 mm (average of 4.342 mm); hamuli 6.

Head in front view $1.5 \times$ as wide as long; POL:OOL = 1:0.6. Clypeus $1.5 \times$ as wide as long; anterior margin shallowly and widely emarginate; antero-lateral angles rounded.

Microsculpture and punctuation of head and body similar to that of female.

Tergum VII (Fig. 6) with surface noticeably depressed and with hindmargin with a short median slit. Sterna I–VI unmodified; sternum VII trilobed, basally markedly concave between swollen and posteriorly produced lateral lobes and with median lobe flat and densely setose.

Etymology.—The name *australis* draws attention to the southern provenance of the species.

Material examined.—Holotype: ♂, SOUTH AFRICA: WESTERN CAPE: Witsand (34.23S

20.52E), 14.viii.2002 (F. W. and S. K. Gess) (ex nest in shell of *Theba pisana* (Müll.), Helicidae) [AMG]. Paratypes: SOUTH AFRICA: WESTERN CAPE: same data as holotype, 7 ♀♀, 4 ♂♂ (ex nests in shells of *Theba pisana* (Müll.), Helicidae) [AMG].

Geographic distribution.—Known only from the type locality, Witsand, near Port Beaufort at the mouth of the Breë River, a little to the west of the southernmost point of Africa.

Floral associations.—Unknown.

Nesting.—Found nesting in sand-filled shells of the exotic *Theba pisana* (Müll.) (Mollusca: Gasteropoda: Pulmonata: Helicidae) collected from the surface of the sand below bushes growing on supralittoral dunes.

Quartinia bonaespei Gess, new species

Diagnosis.—Very large to gigantic (6.3–7.0 mm). Fore wing with Cula and *2m-cu* complete and as thick as other veins. Tegula short, laterally rounded, with posterior inner corner inwardly produced. Both sexes black with white-marked pronotum, tegula and scutellar lamella and with wide, bright reddish-orange posterior bands on all but last two terga. Male with greatly enlarged and modified fore leg, with somewhat modified middle and hind legs, with tergum VII apico-medially drawn out into a robust, dorsally flattened and apically rounded process, and with sterna medially depressed.

Description.—*Female*: Black. The following are white: medially interrupted transverse band on dorsum of pronotum and minute dot at postero-dorsal angle of same; anterior and posterior thirds of tegula (median third black); medially broadly interrupted band on lamellate margin of scutellum. Bright reddish-orange are: mandibles distally; posterior markings dorsally (i. e. not extending down sides) on terga I–IV (that of tergum I wide, covering entire dorsal surface, that of II slightly narrower, that of III wide medially but narrowed laterally, that of IV a median

transverse spot). Labrum brown. Under-side of antennae, to various degrees, pale. Coxa, trochanter, femur and tibia of all legs black with exception of yellowish streak on antero-dorsal surface of fore tarsus and same colour on extreme base of middle and hind tibiae; tarsomeres dark brown. Wings brown; veins dark brown to black.

Length 6.3–7.0 mm (average of 5:6.7 mm); length of fore wing 4.3–4.5 mm (average of 5:4.4 mm); hamuli 6.

Head in front view $1.29 \times$ as wide as long, microreticulate, matt, with small, shallow punctures (sparse on clypeus, well separated on lower part of frons but progressively closer on upper part of frons and on vertex). POL:OOL = 1:0.75. Clypeus $1.3 \times$ as wide as long; anterior margin shallowly emarginate; antero-lateral angles rounded.

Mesosoma microreticulate, matt, with punctures slightly larger and deeper than on head (moderately well separated on mesoscutum and scutellum, closer on pronotum and upper part of mesopleuron where sculpture almost reticulate-punctate).

Gaster microreticulate but shiny; punctures finer and shallower than on head and mesosoma, becoming progressively finer posteriorly.

Male: Black. White markings as in female. Bright reddish-orange markings on gaster similar to those of female but present also on tergum V where transverse as on anterior terga. Underside of flagellomeres, antero-distal spot on fore femur, dorsal and anterior surfaces of fore tibia, fore tarsus, yellowish-orange.

Length 6.3 mm; length of fore wing 4.6 mm; hamuli 6.

Head in front view $1.33 \times$ as wide as long, much more finely microreticulate and much more finely punctate than in female, moderately shiny. POL:OOL = 1:0.7. Clypeus shorter than that of female, $1.46 \times$ as wide as long.

Mesosoma much more finely microreticulate and much more finely punctate than in female, moderately shiny.

Fore leg much modified; coxa and trochanter enlarged; femur (Fig. 1) greatly swollen, postero-basally with pointed tubercle, its posterior surface depressed, smooth and very shiny and forming an angle with ventral surface; tibia greatly enlarged, ventrally with its swollen basal section fitting into opposing disto-ventral emargination of femur (best seen in anterior view); tarsomeres robust, noticeably setose. Middle and hind legs more robust than those of female; femora of both these legs swollen beneath but longitudinally grooved over distal half to accommodate tibia when opposed; tarsomeres II–IV of middle leg noticeably wider than those of hind leg.

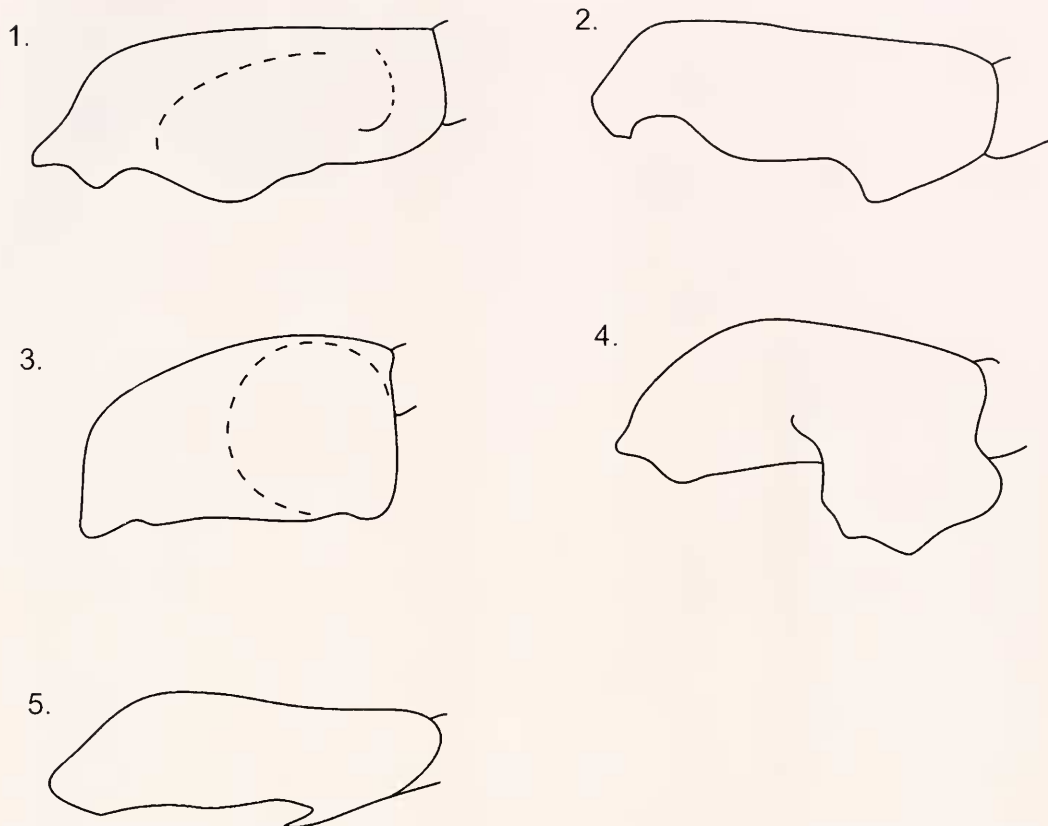
Gaster very finely microreticulate, shiny.

Tergum VII (Fig. 7) baso-laterally with a pronounced rounded tubercle, apico-medially drawn out into a robust, dorsally flattened and apically rounded process raised above depressed surface on either side of it; process dorsally with a slight median longitudinal carina and laterally on each side with a smooth low carina (carried forward some distance onto the tergal disk) at angle formed by its dorsal and lateral surfaces; hind margin of tergum in lateral view forming a low smooth curve from basal tubercle to tip of apical process.

Sternum II–VI depressed medially; sternum II markedly so; III–VI progressively less so.

Etymology.—The name *bonaespei*, a Latin noun in the genitive, refers to the Cape of Good Hope and draws attention to the provenance of the species, especially to the type locality which is within sight of Table Mountain.

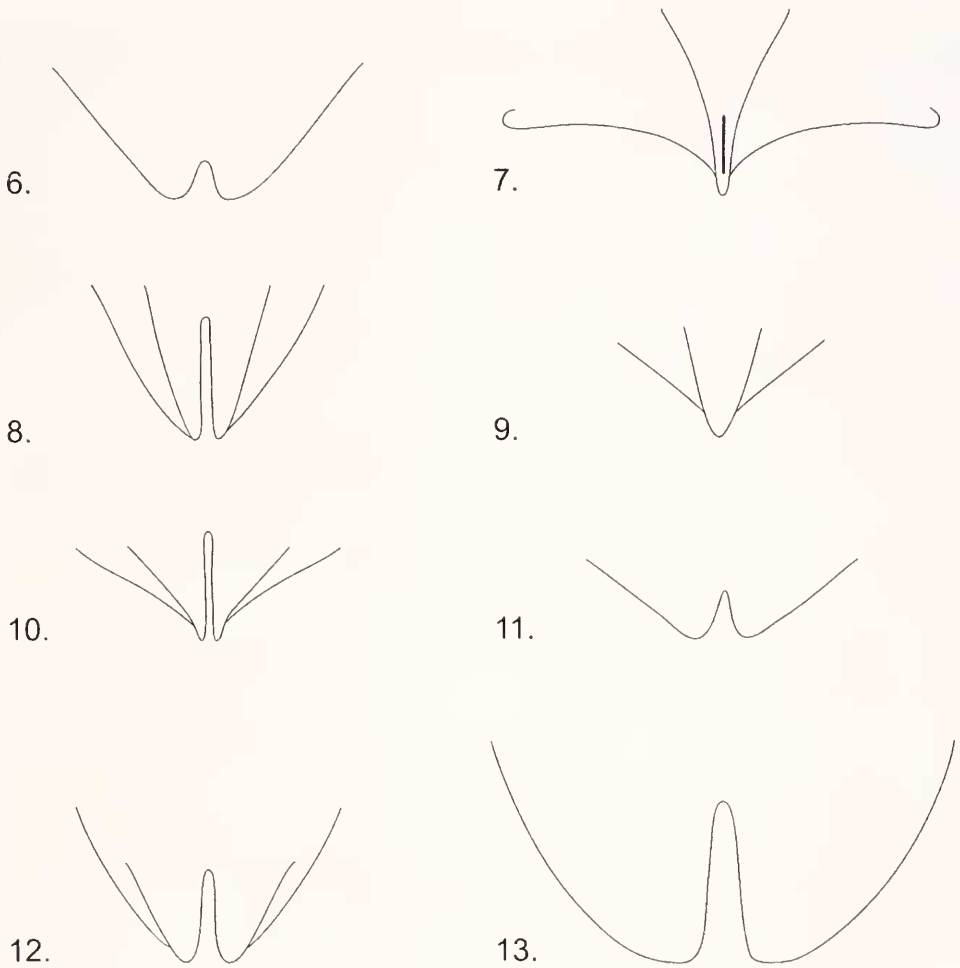
Material examined.—Holotype: ♂, SOUTH AFRICA: WESTERN CAPE: on coast 4 km north of Bloubergstrand (33.46S 18.27E), 12–13.viii.2002 (F. W. and S. K. Gess) (on ground) [AMG]. Paratypes: SOUTH AFRICA: WESTERN CAPE: Donkinsbaai, 10 km S of Doornbaai, low vegetated dunes and slacks behind beach (31.54S 18.17E), 9.ix.2005 (F. W. and S. K. Gess), 8 ♀♀ (4 ♀♀ from sand-filled *Trigonophrus*



Figs. 1–5. Left fore femur of male (posterior view). 1. *Quartinia bonaespei*, 2. *Quartinia conchicola*, 3. *Quartinia namaquensis*, 4. *Quartinia vexillata*, 5. *Quartinia femorata*.

shells; 2 ♀♀ reared from mature larvae ex *Quartinia* nests ex sand-filled *Trigonephrus* shells, emerged in lab. first week of June 2006; 2 ♀♀ visiting white centred, pink flowers of *Drosantheum* sp., Aizoaceae: Mesembryanthema) [AMG]; Lamberts Bay, dunes behind beach (32.05S 18.19E), 28.ix.2005 (F. W. and S. K. Gess), 1 ♀ (from *Trigonephrus* shell) [AMG]; Lamberts Bay, sandy southern bank of lagoon (32.05S 18.19E), 28.ix.2005 (F. W. and S. K. Gess), 3 ♀♀ (visiting yellow flowers of *Conicosia*, Aizoaceae: Mesembryanthema) [AMG]; Elands Bay, low vegetated dunes behind beach (32.19S 18.20E), 30.ix.2005 (F. W. and S. K. Gess), 3 ♀♀, 1 ♂ (1 ♀ from sand filled *Trigonephrus* shell; 2 ♀♀ visiting pink flowers of *Drosantheum*, Aizoaceae: Mesembryanthema; 1 ♂ reared ex *Quartinia* nest in sand-filled *Theba pisana* (Müll.) shell, emerged in lab. 6.viii.2006) [AMG]; Roscherpan Nature Reserve (32.36S 18.18E), 24.iii.2001 (Feurerer & Thell), 4 ♀♀, 1 ♂ (from shells of

Trigonephrus porphyrostoma (Melvill & Ponsonby) [Zool. Mus Berlin]; Yzerfontein (33.20S 18.10E), 15.x.2006 (D. W., G. T. and G. M. Gess), 1 ♀ (ex *Theba pisana* shell) [AMG]; S of Yzerfontein (33.22S 18.11E), 15.x.2006 (D. W., G. T. and G. M. Gess), 1 ♀ (on sand) [AMG]; Melkbosstrand (33.42S 18.26E), 10.x.2005 (F.W. and S. K. Gess), 2 ♀♀ (1 ♀ on sand beneath flowering *Trachyaudra divaricata* (Jacq.) Kunth., Asphodelaceae; 1 ♀ reared from mature larva ex *Quartinia* nest ex sand-filled *Theba pisana* shell) [AMG]; on coast 4 km north of Bloubergstrand (33.46S 18.27E), 12–13.viii.2002 (F. W. and S. K. Gess), 11 ♀♀, (6 ♀♀, 3 ♀♀ visiting white flowers of *Trachyaudra divaricata*; 1 ♀ visiting purplish pink flowers of Aizoaceae: Mesembryanthema; 1 ♀ ex nest in sand-filled *Trigonephrus* shell) [AMG]; same locality, 5.x.2005 (F. W. and S. K. Gess), 4 ♀♀, 1 ♂ (1 ♀ from sand filled *Trigonephrus* shell; 1 ♀ visiting white flowers of *Trachyaudra divaricata*; 2 ♀♀ on sand beneath flowering *Trachyan-*



Figs. 6–13. Tergum VII of male (postero-dorsal view). 6. *Quartinia australis*, 7. *Quartinia bonaespei*, 8. *Quartinia conchicola*, 9. *Quartinia namaquensis*, 10. *Quartinia obibensis*, 11. *Quartinia refugicola*, 12. *Quartinia vexillata*, 13. *Quartinia femorata*. [Tergum VII of *Quartinia namaqua* is very similar to that of *Quartinia obibensis* (Fig. 10)].

dra divaricata; 1 ♂ reared ex *Quartinia* nest in sand-filled *Theba pisana* shell, emerged in lab. 8.viii.2006 [AMG].

Geographic distribution.—Known only from the supra-littoral dunes of the Atlantic seaboard of the Western Cape, from Donkinsbaai, circa 220 km north of Cape Town to Bloubergstrand at the northern extremity of Table Bay (the type locality). At Yzerfontein it has been found together with *Q. namaqua* and *Q. obibensis*.

Floral associations.—Asphodelaceae (*Trachyandra*) and Aizoaceae: *Mesembryanthema* (including *Conicosia* and *Drosanthemum*).

Nesting.—The collection at all the listed localities of adult females from sand-filled snail shells, the discovery of an adult female at Bloubergstrand in a shell containing also an open cell provisioned with a mixture of pollens including that of *Trachyandra divaricata*, and the rearing in the lab of adults from mature larvae extracted from cells found in shells from four of the localities, demonstrates that this species, like others occurring in sandy areas, utilizes sand-filled snail shells as a nesting niche. Shells of the indigenous desert snail, *Trigonephrus* species (Mollusca: Gasteropoda: Pulmonata: Dorcasii-

dae) are the original ones utilized and appear to be preferred; where these are in short supply, the smaller, thinner and therefore less opaque shells of the exotic *Theba pisana* (Müll.) (Mollusca: Gastropoda: Pulmonata: Helicidae) are used.

Quartinia conchicola Gess, new species

Quartinia sp. (larger sp.) (Gess and Gess 1999, nesting)

Diagnosis.—Very large (5.6–6.3 mm). Fore wing with *Cu*_{1a} and *2m-cu* complete and as thick as other veins. Both sexes with vertex behind posterior ocelli depressed, somewhat concave; with fore coxa not swollen basally nor anteriorly produced but evenly curved. Male with fore femur enlarged, excavated beneath and undulate postero-ventrally; tibia robust, markedly swollen, appreciably shorter than femur and, when opposed to femur, fitting into ventral excavation of same.

Description.—*Female:* Black. The following are yellowish-white: short (almost medially interrupted) and laterally widening transverse band on dorsum of pronotum and minute spot at postero-dorsal angle of same; humeral streak of varying length; anterior and posterior thirds of tegula (median third clear, testaceous); medially interrupted band on lamellate margin of scutellum (specimens from Hondeklip Bay only). (The specimen from Knersvlakte lacks the humeral streak as do those from between Alexander Bay and Port Nolloth which in addition have the other markings on the thorax reduced and reddish-brown. Those from W of Wallekraal are without thoracic markings.) The following are various shades of light reddish brown: mandible (other than base); labrum; lower aspect of pedicel and flagellum; posterior bands (in some specimens widened medially and usually not attaining lateral margins) on terga I–IV (or V); apices of all femora; most of tibia and tarsus of all legs. Venation light brown at base of wings, otherwise very dark brown.

Wing membrane very slightly browned. Length 5.6–6.3 mm (average of 8 = 6.1 mm); length of fore wing 3.7–4.2 mm (average of 8 = 4.1 mm); hamuli 6.

Head in front view 1.3–1.34 × as wide as long; POL:OOL = 1:0.65 (average of 5). Vertex behind posterior ocelli depressed, somewhat concave.

In general facies similar to male (described below) but with legs and last tergum simple.

Male: Head and mesosoma black, gaster and greater part of femora of all legs very dark brown to almost black. The following are yellowish-white: pair of small spots on frons immediately above frontoclypeal suture (in specimens from north of Vanrhynsdorp only); short (almost medially interrupted) and laterally widening transverse band on dorsum of pronotum and minute spot at postero-dorsal angle of same; humeral streak of varying length; anterior and posterior thirds of tegula (median third clear, testaceous); medially interrupted band on lamellate margin of scutellum. (In a specimen from between Alexander Bay and Port Nolloth the humeral markings are absent and the other markings on the thorax are reddish-brown.) The following are various shades of light reddish brown: mandible (other than base); labrum; lower aspect of scape, pedicel and flagellum; posterior bands (slightly widened medially and laterally but not attaining lateral margins) on terga I–VI; apices of all femora; most of fore tibia; middle tibia and hind tibia to variable extent and tarsus of all legs. Venation light brown at base of wings, otherwise very dark brown. Wing membrane very slightly browned.

Length circa 5.8–6 mm; length of fore wing circa 4–4.5 mm.

Head, mesosoma and terga I–VII very finely microsculptured (shagreened) but nevertheless shiny.

Head in front view 1.4–1.45 × as wide as long; POL:OOL = 1:0.65. Vertex behind posterior ocelli depressed, somewhat concave.

Tegula with posterior inner corner inwardly produced. Wing venation with Cu1 and 2*m-cu* complete and as thick as other veins.

Fore leg with coxa unmodified; femur (Fig. 2) enlarged, excavated beneath and undulate postero-ventrally; tibia robust, markedly swollen, appreciably shorter than femur and when opposed to femur fitting into ventral excavation of same.

Middle and hind femora robust but otherwise not markedly modified.

Sternum I postero-medially very slightly bi-tuberculate; sternum II somewhat raised on either side of median area. Tergum VII (Fig. 8) in posterior half with dorsal surface raised laterally and delimited by low carinae, produced apically and with a deep, narrow, slightly sub-parallel median slit.

Etymology.—The name *conchicola* is a compound word formed from the Latin words *concha* – *ae* – the shell of a mollusc, and *cola* – a dweller. It serves to draw attention to the species' association, albeit not unique, with sand-filled shells of the Desert Snail, *Trigonephrus*, in which its nests are sheltered from prevailing winds.

Material examined.—Holotype: ♂, SOUTH AFRICA: WESTERN CAPE: 12 km N of Vanrhynsdorp (31.31S 18.43E), 27.ix.2005 (F. W. and S. K. Gess) (dead, ex nest in sand-filled *Trigonephrus* shell) [AMG]. Paratypes: SOUTH AFRICA: NORTHERN CAPE: Richtersveld National Park, 1.5 km from Helskloof Gate (28.18S 16.57E), 8.ix.1996 (F. W., S. K. and R. W. Gess), 1 ♀ (on white flowers of *Pelargonium klinghardtense* Knuth, Geraniaceae) [AMG]; Richtersveld, W of Brandkaros (28.29S 16.40E), 15.ix.1996 (F. W., S. K. and R. W. Gess), 1 ♂ (dead) and fragments of 2 further ♂♂ (ex nests in sand-filled *Trigonephrus* shells) [AMG]; between Alexander Bay and turnoff to Oranjemund (28.35S 16.30E) 13.ix.1996 (F. W., S. K. and R. W. Gess), 1 ♀ (dead, ex nest in sand-filled *Trigonephrus* shell) [AMG]; 24 km S of Alexander Bay on road to Port Nolloth [= 60 km N of Port Nolloth on road to Alexander Bay] (28.47S 16.38E), 27.ix.1997 (F. W. and S. K. Gess), 5 ♀♀ (4 ex nests in sand-filled *Trigonephrus* shells; 1 on ground) [AMG]; same locality, 11.x.2000 (F. W.

and S. K. Gess), 1 ♀ (visiting pink flowers of *Drosanthemum* sp.) [AMG]; 60 km S of Alexander Bay on road to Port Nolloth (28.51S 16.40E), 19.ix.1996 (F. W., S. K. and R. W. Gess), 1 ♂ (dead, ex nest in sand-filled *Trigonephrus* shell) [AMG]; Hondeklip Bay (30.19S 17.17E), 12.x.1994 (F. W. and S. K. Gess), 3 ♀♀ (visiting yellow flowers of *Conicosia* sp., Aizoaceae: Mesembryanthema) [AMG]; W of Wallekraal (30.21S 17.26E), 8.x.1997 (F. W. and S. K. Gess), 2 ♀♀ (live) and fragments of 1 ♂ (ex nests in sand-filled *Trigonephrus* shells) [AMG]. WESTERN CAPE: Knersvlakte, 48 km N of Vanrhynsdorp (31.14S 18.32E), 20.ix.1996 (F. W., S. K. and R. W. Gess), 1 ♀ [AMG]; 12 km N of Vanrhynsdorp (31.31S 18.43E), 27.ix.2005 (F. W. and S. K. Gess), 2 ♀♀, 2 ♂♂ (dead and incomplete, ex nests in sand-filled *Trigonephrus* shells) [AMG]; SE of Lutzville on road to Vredendal (31.36S 18.23E), 29.ix.2005 (F. W. and S. K. Gess), 3 ♀♀ (reared from mature larvae ex *Quartinia* nests ex sand-filled *Trigonephrus* shells, emerged in lab at the end of April 2007) [AMG].

Geographic distribution.—The species is known from South Africa from the western part of the Northern Cape, mainly along the seaboard from the Orange River southwards, and from the northwestern Western Cape where it extends inland to a distance of about 50 km. It occurs variously together with *Q. namaqua*, *Q. namaquensis*, *Q. obibensis*, *Q. rufigicola* and *Q. vexillata*.

Floral associations.—Aizoaceae: Mesembryanthema (*Conicosia*, *Drosanthemum*), Geraniaceae (*Pelargonium*).

Nesting.—Throughout its presently known distributional area found nesting in sand-filled shells of the desert snail *Trigonephrus* sp. (Mollusca: Gasteropoda: Pulmonata: Dorcasidae). For further details see Gess and Gess (1999).

Discussion.—*Q. conchicola* and *Q. vexillata* appear to be closely allied and at least in the north-western Richtersveld (S of Alexander Bay) overlap in their distribution. Whereas the males are readily distinguishable on the basis of secondary sexual characters – notably the differently modified fore legs – the females are deceptively similar and at first sight are very difficult to separate. They may, however, be distin-

guished by characters which they share with their respective males: *Q. conchicola* by the depressed, somewhat concave vertex and by the unmodified fore coxae and *Q. vexillata* by the evenly convex vertex and by the basally swollen and anteriorly produced fore coxae.

Quartinia namaqua Gess, new species

Diagnosis.—Very large (5.8–6.2 mm). Fore wing with Cu1a and 2*m-cu* complete and as thick as other veins. Tegula with posterior inner corner markedly inwardly produced, reddish brown. Both sexes with head and thorax black (except, in most specimens, a small reddish-brown marking medially on anterior margin of pronotum); gaster black with a variable number of reddish brown posterior bands which do not attain sides of terga. Parapsidal furrows very noticeable. Male with clypeus evenly convex (not medially depressed), closely and finely sculptured; with sternum I postero-medially raised into a pronounced tubercle; tubercle viewed from behind with widely rounded (almost subtruncate) apex, viewed from the side sloping steeply anteriorly and falling steeply posteriorly to hind margin of sternum. Tergum VII with distinct dorsal and lateral surfaces; apex drawn out into a pair of parallel processes flanking narrow and slit-like emargination; emargination produced anteriorly as a median impression.

Description.—*Female:* Black. The following are reddish-brown: mandibles distally; underside of pedicel and flagellum; in two of the northern specimens a mere indication of a transverse marking on anterior margin of pronotum; tegula; posterior bands not attaining sides on terga 1–IV (in southern specimens on terga I–III only); that on I of even width and covering about half of tergum; those of terga II and III narrower but medially expanded; that of IV short or (in two specimens) barely indicated; in northern specimens apex of femur, entire or most of tibia, tarsomeres

(progressively darkened) of all legs; in two of the southern specimens apex of femur, base and apex of tibia and base of first tarsomere only. Wings slightly darkened; veins brown.

Length 6.2 mm; length of fore wing 3.9 mm; hamuli 6.

Head in front view $1.3 \times$ as wide as long; clypeus $1.1 \times$ as wide as long (length measured to bottom of emargination); POL:OOL = 1:0.9. Clypeus very closely microsculptured, with barely discernable shallow punctures, dull; frons and vertex similarly microsculptured but somewhat more obviously punctured, moderately shiny; mesosoma microsculptured with obvious shallow punctures; interstices of puncture width or less; parapsidal furrows very obvious; gaster finely and closely punctured, shiny.

Male: Black. The following are reddish-brown: mandibles distally; scape apically, pedicel, upper and lower side of flagellomeres (except distal part of club); transverse marking on anterior margin of pronotum; tegula; posterior band not attaining sides on tergum I and mere indication of band on tergum II; apex of femur, most of tibia, tarsomeres (progressively darkened) of all legs.

Length 5.8 mm; length of fore wing 3.6 mm; hamuli 6.

Head in front view $1.4 \times$ as wide as long; clypeus $1.1 \times$ as wide as long (length measured to bottom of emargination); POL:OOL = 1:0.8. Clypeus evenly convex, closely microsculptured, with barely discernable shallow punctures, only moderately shiny; frons and vertex similarly microsculptured but somewhat more obviously punctured, moderately shiny; mesosoma microsculptured with obvious shallow punctures; interstices of puncture width or less; parapsidal furrows very obvious; gaster finely and closely punctured, shiny. Sternum I postero-medially raised into a pronounced tubercle; tubercle viewed from behind with widely rounded (almost subtruncate) apex, viewed from

the side sloping steeply anteriorly and falling steeply posteriorly to hind margin of sternum. Tergum VII with distinct dorsal and lateral surfaces; apex drawn out into a pair of parallel processes flanking narrow and slit-like emargination; emargination produced anteriorly as a median impression.

Etymology.—The name, *namaqua*, a noun in apposition to the generic name, is derived from the Namaqua people of Namaqualand and refers to the provenance of the species.

Material examined. — Holotype, ♂, SOUTH AFRICA: NORTHERN CAPE: Inland of Hondeklip Bay (30.19S 17.17E), 25.ix.2005 (F W and S K Gess) (ex nest in sand-filled *Trigonephrus* shell) [AMG]. Paratypes: SOUTH AFRICA: NORTHERN CAPE: same data as holotype, 1 ♀ [AMG]; between Hondeklip Bay and Wallekraal (30.22S 17.28E), 25.ix.2005 (F W and S K Gess), 1 ♀ (ex nest in sand-filled *Trigonephrus* shell) [AMG]. WESTERN CAPE: SE of Lutzville on road to Vredendal (31.36S 18.23E), 29.ix.2005 (F W Gess and S K Gess), 1 ♀ (visiting yellow flowers of *Conicosia* sp., Aizoaceae: Mesembryanthema) [AMG]; Yzerfontein (33.20S 18.10E), 15.x.2006 (D. W., G. T. and G. M. Gess), 3 ♀♀ (ex *Theba pisana* shells) [AMG].

Geographic distribution.—The species is known from South Africa from the southwestern Northern Cape, from the northwestern Western Cape, and from Yzerfontein in the southwestern Western Cape, and therefore will probably be found to occur all along the coastal sandveld between the above areas. It occurs variously together with *Q. bonaespei*, *conchicola*, *namaquensis* and *obibensis*.

Floral associations.—Aizoaceae: Mesembryanthema (*Conicosia*).

Nesting.—At two localities found nesting in sand-filled shells of the desert snail *Trigonephrus* sp. (Mollusca: Gasteropoda: Pulmonata: Dorcasiidae) and at another obtained from shells of the exotic *Theba pisana* (Müll.) (Mollusca: Gasteropoda: Pulmonata: Helicidae).

Discussion.—*Q. namaqua* is superficially very similar to *Q. obibensis*, most notably in

the male in the possession of a raised tubercle postero-medially on sternum I. It may be distinguished in both sexes by the more distinct and somewhat less close puncturation of the mesoscutum and scutellum, by the broader and much more noticeable parapsidal furrows, and by the interocellar distance only slightly exceeding the ocellar-ocular distance [POL:OOL = 1:0.9 (♀) and 1:0.8 (♂) as against 1:0.7 (both sexes)]. The male may be distinguished by the evenly convex, closely microsculptured and only moderately shiny clypeus in contrast to the medially depressed, non-microsculptured but sparsely punctured and shiny clypeus of *Q. obibensis*. In colour pattern the species differs in that the reddish-brown markings are reduced, most notably in that the posterior bands on the gaster do not attain the lateral margins of the terga.

Quartinia namaquensis Gess, new species

Diagnosis.—Very large (5.8–6.0 mm). Fore wing with *Cu*₁ and *2m-cu* complete and as thick as other veins. Tegula short, laterally rounded, with posterior inner corner inwardly produced. Male black with white-marked labrum, clypeus, frons, pronotum, tegula, scutellar lamella, and terga I–VI. Fore leg greatly enlarged and modified; middle and hind legs somewhat modified. Tergum VII drawn out apico-medially into a robust, pointed, dorsally flattened and apically narrowly rounded process.

Description.—*Male*: Black. The following are white: labrum; disc of clypeus; paracircular streak from mandibular insertion to level of top of antennal socket (specimen from Wallekraal only); supra-clypeal marking (more or less quadrate and bilobed dorsally in specimens from Liefontein but in specimen from Wallekraal expanded on each side with lobe directed laterally towards ocular sinus and another directed dorsally); underside of scape, pedicel and proximal flagellomeres; continuous anterior

or band on pronotum (narrowly and pointedly extended a little along dorso-lateral margin and broadly continuous onto humerus and beyond) and minute spot on postero-dorsal angle of same; small spot at top of mesopleuron (specimen from Wallekraal only); tegula (except for median testaceous area); scutellar lamella (other than medially); lower two thirds of metanotum (specimen from Wallekraal only); minute dots dorsally on propodeum (one specimen from Leliefontain only) or small streak unilaterally on angle of propodeum (specimen from Wallekraal only); narrow posterior bands, almost reaching sides, on terga I–VI. The following are light reddish yellow: mandible (except base and apex); labrum (if not white); posterior bands, slightly medially expanded, on sterna; underside of trochanter of all legs; entire anterior surface of fore femur as well as posterior surface of basal lamelliform angle of same; underside of basal half of mid femur (most specimens); apices of femora and entire tibiae, tarsi and claws of all legs. Wing membrane sub-hyaline; veins brown.

Length 5.8–6.0 mm.; length of fore wing 3.8–3.9 mm.; hamuli circa 6.

Head in front view $1.33 \times$ as wide as long, microreticulate, moderately shiny, with shallow punctures (small and close on frons, slightly larger and more widely spaced on vertex). POL:OOL = 1:0.59. Clypeus $1.5 \times$ as wide as long in midline; anterior margin widely and shallowly emarginate.

Mesosoma microreticulate, moderately shiny, with punctures larger than those on head (moderately well separated on pronotum, mesoscutum and scutellum).

Tegula short, laterally rounded, with posterior inner corner inwardly produced.

Fore leg much modified; coxa and trochanter enlarged; femur (Fig. 3) greatly swollen, its posterior surface in proximal half markedly concavely excavate, smooth and very shiny, its baso-ventral region angulate and sublamellate; first tarsomere swollen, excavate and setose below; second

tarsomere in posterior view curved, wide at base but otherwise narrow, with long, backwardly curved setae; middle and hind legs beneath with trochanters flattened and with femora angulate, flattened in proximal half and longitudinally grooved in distal half.

Metasoma moderately shiny, with punctures finer than those on head. Tergum VII (Fig. 9) drawn out apico-medially into a robust, pointed, dorsally flattened and apically narrowly rounded process.

Female: Unknown, none of the specimens of several species from the relevant localities being assignable with any degree of confidence to this species.

Etymology.—The name, *namaquensis*, an adjective, is derived from the Namaqua people of Namaqualand and refers to the provenance of the species.

Material examined.—Holotype, ♂, SOUTH AFRICA: NORTHERN CAPE: Leliefontein (30.23S 18.16E), 31.vii.2003 (C. Mayer), 1 ♂ (yellow trap) [AMG]. Paratypes: SOUTH AFRICA: NORTHERN CAPE: same data as holotype but date 15.ix.2003, 1 ♂ [AMG]; same data as holotype but date 22.viii.2004, and trap white, 1 ♂ [AMG]; W of Wallekraal (30.21S 17.26E), 8.x.1997 (F. W. and S. K. Gess), 1 ♂ (ex nest in sand-filled *Trigonephrus* shell) [AMG].

Geographic distribution.—Known only from two localities in Namaqualand, one in the coastal sandveld, the other in the Kamiesberg. In the former locality it occurs together with *Q. conchicola* and *Q. namaqua*.

Floral associations.—Unknown.

Nesting.—One specimen, freshly eclosed and with wings not yet fully hardened, was extracted from a cell of a nest in a sand-filled shell of the desert snail *Trigonephrus* sp. (Mollusca: Gasteropoda: Pulmonata: Dorcasiidae).

Quartinia obibensis Gess, new species

Diagnosis.—Large to very large (5.2–5.7 mm). Fore wing with *Cu*_{1a} and *2m-cu* complete and as thick as the other veins. Tegula with posterior inner corner markedly inwardly produced, reddish brown. Both

sexes with head and thorax predominantly black with limited reddish-brown markings; gaster black with well developed reddish-brown posterior bands attaining or almost attaining side of terga. Male with clypeus medially depressed, sparsely punctured and shiny; with sternum I postero-medially raised into a small tubercle; tubercle viewed from behind transversely subtriangular with a narrowly rounded apex, viewed from the side sloping gradually anteriorly and falling steeply posteriorly to hind margin of sternum. Tergum VII with distinct dorsal and lateral surfaces; apex drawn out into a pair of parallel processes flanking narrow and slit-like emargination; emargination produced anteriorly as a median impression.

Description.—*Female.* Black. The following are reddish-brown: mandibles (except base); underside of pedicel and flagellomeres; anterior margin of pronotum and postero-dorsal angle of same; tegula; crescent (in some specimens broken up into spots) posteriorly and laterally on disk of scutellum; scutellar lamella; in some specimens lower half of metanotum; posterior bands attaining or almost attaining sides on terga I–V; that on I of even width and covering about half of tergum; those of terga II–V progressively narrower, undulate, expanded medially and laterally and attaining or almost attaining sides of terga); apical spot on tergum IV; apex of femur, entire tibia, tarsomeres (except last) of all legs. Last tarsomere and claws brown. Wings slightly darkened; veins brown.

Length 5.2–5.7 mm (average of 4:5.4 mm); length of fore wing 3.6–3.7 mm (average of 4:3.7 mm); hamuli 5.

Head in front view $1.35 \times$ as wide as long, microreticulate, matt, with inconspicuous, very shallow, fine punctures. POL:OOL = 1:0.7. Clypeus $1.33 \times$ as wide as long (length measured to bottom of emargination; $1.2 \times$ if measured to level of antero-lateral angles); anterior margin smooth, shiny, shallowly and evenly emarginate.

Mesosoma microreticulate with close, shallow, fine punctures, slightly shiny.

Gaster finely microreticulate but shiny; punctures finer than those on mesosoma, becoming progressively finer distally.

Tegula with posterior inner corner markedly inwardly produced.

Male. Black. The reddish-brown markings as in the female, with in addition: labrum (to varying degree); in some specimens small antero-lateral spots (occasionally joined) on clypeus.

Length 5.2 mm; length of fore wing 3.5 mm.

POL:OOL = 1:0.7

Clypeus medially depressed, non-microsculptured but sparsely punctured and shiny. Sternum I postero-medially raised into a small tubercle; tubercle, viewed from behind, transversely subtriangular with a narrowly rounded apex, anteriorly gradually sloping, posteriorly falling steeply to hind margin of sternum. Tergum VII (Fig. 10) with distinct dorsal and lateral surfaces; apex drawn out into a pair of parallel processes flanking narrow and slit-like emargination; emargination produced anteriorly as a median impression.

Etymology.—The name, *obibensis*, an adjective, is derived from the Obib Mountains in the Sperrgebiet of south-western Namibia, the site from which the largest number of specimens was obtained.

Material examined.—Holotype: ♂, NAMIBIA: Sperrgebiet, Obib camp site (28.00S 16.39E), 14.ix.2003 (F. W. and S. K. Gess) (ex nest in sand-filled *Trigonephrus* shell, emerged in the lab. 15–22.x.2003) [AMG]. Paratypes: NAMIBIA: Sperrgebiet, W of Klinghardtberge (27.17S 15.36E), 20.ix.2003 (F. W. and S. K. Gess), 4 ♀♀ (ex nests in sand-filled *Trigonephrus* shells) [AMG]; Sperrgebiet, Klinghardtberge (27.19S 15.46E), 10.ix.2005 (F. W. and S. K. Gess), 1 ♀ (reared ex *Quartinia* nest in sand-filled *Trigonephrus* shell) [AMG]; Sperrgebiet, Klinghardtberge (27.30S, 15.44E), 10.ix.2005 (F. W. and S. K. Gess), 1 ♀, 1 ♂ (reared ex *Quartinia* nests in sand-filled *Trigonephrus* shells) [AMG]; Aus – Rosh Pinah (27.44S 16.42E), 25.ix.2003 (F. W. and S. K. Gess), 1 ♂ (visiting white centered, purplish-pink rayed *Drosanthemum* sp., Aizoaceae: Mesembrianthema) [AMG]; Sperrgebiet,

between Aurusberg and Scorpion Mine (27.45S 16.32E), 15.ix.2003 (F. W. and S. K. Gess), 1 ♀, 2 ♂♂ (ex nests in sand-filled *Trigonephrus* shells) [AMG]; Sperrgebiet, Scorpion Mine (27.49S 16.35E), 15.ix.2003 (F. W. and S. K. Gess), 4 ♀♀, 1 ♂ (ex nests in sand-filled *Trigonephrus* shells) [AMG]; Sperrgebiet, Obib camp site (28.00S 16.39E), 14.ix.2003 (F. W. and S. K. Gess), 37 ♀♀, 13 ♂♂ (ex nests in sand-filled *Trigonephrus* shells; 26 ♀♀, 2 ♂♂ emerged in the lab. 15–22.x.2003; 7 ♀♀, 2 ♂♂ emerged in lab. at a later date) [AMG]; 12.8 km S Rosh Pinah (28.03S 16.51E) 11.ix.1996 (F. W., S. K. and R. W. Gess), 3 ♀♀, 3 ♂♂ (ex nests in sand-filled *Trigonephrus* shells; 2 ♀♀, 3 ♂♂ emerged in lab.) [AMG]. SOUTH AFRICA: NORTHERN CAPE: Richtersveld, W of Brandkaros (28.29S 16.40 E), 15.ix.1996 (F. W., S. K. and R. W. Gess), 3 ♀♀, 1 ♂ (ex nests in sand-filled *Trigonephrus* shells) [AMG]. WESTERN CAPE: Yzerfontein (33.20S 18.10E), 15.x.2006 (D. W., G. T. and G. M. Gess), 2 ♂♂ (ex *Theba pisana* shells) [AMG].

Geographic distribution.—*Q. obibensis* is known from Namibia, from a limited area in the southern half of the Desert and Succulent Steppe (Winter Rainfall Area) of Giess (1971), from South Africa from a nearby locality in the Richtersveld and from a coastal site in the Western Cape. In the north of its range it occurs together with *Q. conchicola*, *Q. rufigicola* and *Q. vexillata* and in the south with *Q. bonaespei* and *Q. namaqua*.

Floral associations.—Aizoaceae: Mesembryanthema (*Drosanthemum*).

Nesting.—Throughout its presently known distributional area found nesting most commonly in sand-filled shells of the desert snail *Trigonephrus* sp. (Mollusca: Gasteropoda: Pulmonata: Dorcasiidae). At one coastal locality in the Western Cape obtained from shells of the exotic *Theba pisana* (Müll.) (Mollusca: Gasteropoda: Pulmonata: Helicidae). For further details see Gess and Gess (1999).

Discussion.—See under *Q. namaqua*.

Quartinia refugicola Gess, new species

Quartinia sp. (smaller sp.) (Gess and Gess 1999, nesting; Greathead 1999, 2006, bombyliid parasite).

Diagnosis.—Medium sized to large (4.1–5.2 mm long). Fore wing with *Cu*₁ and *2m-cu* complete and as thick as other veins. Tegula with posterior inner corner inwardly produced. Posterior bands on terga reaching lateral margins.

Description.—*Female*: Black. The following are yellow or yellow merging into brownish yellow: underside of flagellomeres; short, narrow, transverse band (in some specimens reduced to pair of small marks, in others totally absent) medially on pronotum and in some specimens a minute dot on postero-dorsal angle of same; tegula (except for testaceous medial spot); narrow, medially interrupted, lamellate margin of scutellum; in some specimens median part of metanotum; narrow posterior bands reaching lateral margins on terga I–V (that of tergum I widest, others progressively narrower); in some specimens a diffuse posterior band on sternum II; extreme apex of femur, entire tibia (except for elongate dark mark on posterior surface) and tarsomeres of all legs (except in some specimens brown terminal tarsomeres of middle and hind legs). Mandible with distal half bright ferruginous; labrum brown. Wings subhyaline; veins brown.

Length 4.5–5.2 mm (average of 5:4.8 mm); length of fore wing 3.0–3.4 mm (average of 5:3.2 mm); hamuli 5–6.

Head in front view 1.3 × as wide as long; clypeus 1.5 × as wide as long (length measured to bottom of emargination); POL:OOL = 1:0.6. Clypeus very closely microsculptured, with barely discernable shallow punctures; frons and vertex similarly microsculptured but more obviously punctured (especially in region of ocelli); mesosoma microsculptured with obvious shallow punctures slightly larger than those on vertex and with interstices of puncture width or less; gaster closely and finely punctured.

Male: Black. Pale markings as in female but with the addition of: in some specimens sub-basal spot on mandible between

black base and ferruginous distal half; in **some** specimens part of the clypeus (ranging in extent from pair of anterolateral spots, to uninterrupted anterior margin, to most of disc with exception of region below antennal sockets); in **all** specimens narrow posterior band on tergum VI and in **most** specimens apices of tergum VII.

Length 4.1–4.3 mm (average of 5:4.2 mm); length of fore wing 2.8–2.9 mm (average of 5:2.8 mm); hamuli 4.

Head in front view $1.37 \times$ as wide as long; clypeus convex, $1.5 \times$ as wide as long; POL:OOL = 1:0.6. Microsculpture and puncturation as in female. Tergum VII (Fig. 11) dorsally slightly depressed (flattened) and its apical margin with a narrow V-shaped median emargination flanked by narrowly rounded projections.

Etymology.—The name *refugicola* is a compound word formed from the Latin words *refugium* – *ii* (n) – a place of refuge, and *cola* – a dweller. It serves to draw attention to the species' association with sand-filled cavities in which its nests are sheltered from prevailing winds.

Material examined.—Holotype: ♂, NAMIBIA: 12.8 km S of Rosh Pinah (28.03 S 16.51E), 11.ix.1996 (F. W., S. K. and R. W. Gess) (on ground) [AMG]. Paratypes: NAMIBIA: Aus (26.39S 16.15E), 25.viii.2002 (F. W. and S. K. Gess), 1 ♀ (visiting yellow flowers of *Leysera tenella* DC., Asteraceae) [AMG]; Sperrgebiet, Kaukausib Spring – Grillental (26.58S 15.31E), 5.ix.2002 (F. W. and S. K. Gess), 4 ♀♀ (visiting white flowers of *Zygophyllum clavatum* Schltr. & Diels, Zygophyllaceae) [AMG]; Sperrgebiet, near Grillental (26.59S 15.23E), 5.ix.2002 (F. W. and S. K. Gess), 1 ♂ (visiting yellow flowers of *Foveolina albida* (DC.) Källersjö, Asteraceae) [AMG]; Sperrgebiet, Grillental (27.00S 15.21E), 8.ix.2005 (F. W. and S. K. Gess), 3 ♀♀, 1 ♂ (visiting white flowers of *Zygophyllum* sp.) [AMG]; Sperrgebiet, Klinghardtberge, Tsabiamps Camp (27.10 S 15.42E), 4.ix.2002 (F. W. and S. K. Gess), 1 ♀ (visiting yellow flowers of *Dimorphotheca polyptera* DC., Asteraceae) [AMG]; Sperrgebiet, Klinghardtberge (27.14S 15.43E), 1–3.ix.2002 (F. W. and S. K. Gess), 5 ♀♀ (1 ♀

visiting flowers of ? *Cotula* sp., Asteraceae; 1 ♀ visiting yellow flowers of *Pteronia* sp., Asteraceae; 3 ♀♀ visiting yellow flowers of *Zygophyllum simplex* L., Zygophyllaceae) [AMG]; Sperrgebiet, Klinghardtberge (27.14S 15.44E), 2.ix.2002 (F. W. and S. K. Gess), 6 ♀♀, 1 ♂ (3 ♀♀ visiting yellow flowers of *Pteronia* sp., Asteraceae; 3 ♀♀ visiting apricot coloured flowers of *Phyllobolus occulatus* (N.E.Br.) Gerbaulet, Aizoaceae: Mesembryanthema; 1 ♂ visiting pink flowers of *Sarcocaulon* sp., Geraniaceae) [AMG]; Sperrgebiet, W of Klinghardtberge (27.17S 15.36E), 20.ix.2003 (F. W. and S. K. Gess), 5 ♀♀, 3 ♂♂ (ex nests in sand-filled *Trigonephrus* shells) [AMG]; Sperrgebiet, Klinghardtberge (27.18S 15.54E), 2.ix.2002 (F. W. and S. K. Gess), 1 ♂ [AMG]; Sperrgebiet, Klinghardtberge (27.19S 15.46E), 10.ix.2005 (F. W. and S. K. Gess), 2 ♀♀, 1 ♂ (reared from larvae ex *Quartinia* nests ex sand-filled *Trigonephrus* shells) [AMG]; Sperrgebiet, Klinghardtberge, Nomitsas (27.27S 15.52E), 31.viii.2002 (F. W. and S. K. Gess), 1 ♀, 1 ♂ (ex sand-filled *Trigonephrus* shells) [AMG]; Sperrgebiet, Uguchab River, NW of Aurus Mountains (27.31S 16.12E), 17.ix.2003 (F. W. and S. K. Gess), 31 ♀♀, 20 ♂♂ (17 ♀♀, 10 ♂♂ ex sand-filled *Trigonephrus* shells; 14 ♀♀, 10 ♂♂ ex nests in sand-filled *Trigonephrus* shells) [AMG]; 12.8 km S of Rosh Pinah (28.03 S 16.51E), 11.ix.1996 (F. W., S. K. and R. W. Gess), 29 ♀♀, 32 ♂♂ (21 ♀♀, 26 ♂♂ on ground; 1 ♀ visiting yellow flowers of *Cotula* sp., Asteraceae; 1 ♀ on blue rayed *Filicia* sp., Asteraceae; 1 ♀, 1 ♂ visiting yellow flowers of *Hirpicium* sp., Asteraceae; 1 ♀, 1 ♂ visiting yellow flowers of *Osteospermum* sp., Asteraceae; 1 ♀ visiting yellow flowers of *Griechum* sp., Neuradaceae; 3 ♀♀, 4 ♂♂ ex nests in sand-filled *Trigonephrus* shells; 2 ♂♂ ex sand-filled cavities in calcrete) [AMG]; Sperrgebiet, W of Obib Mountains (28.08S 16.42E), 15.ix.2003 (F. W. and S. K. Gess), 1 ♀ (ex nest in sand-filled *Trigonephrus* shell) [AMG]; E of Oranjemund, 28 km from checkpoint on road to Sendelingsdrif (28.26S 16.42E), 25.ix.1997 (F. W. and S. K. Gess), 1 ♂ (ex nest in sand-filled *Trigonephrus* shell) [AMG]; E of Oranjemund (28.30S 16.36E), 22.ix.1997 (F. W. and S. K. Gess), 1 ♂ (ex nest in sand-filled *Trigonephrus* shell) [AMG]. SOUTH AFRICA: NORTHERN CAPE: W of Brandkaros (28.29S 16.40E), 13–15.ix.1996 (F. W., S. K. and R. W. Gess), 4 ♀♀ (1 dead), 1 ♂ (dead) (ex nests in sand-filled *Trigonephrus* shells) [AMG]; 60 km N of Port Nolloth (28.47S 16.38E), 27.ix.1997 (F. W.

and S. K. Gess), 1 ♂ (ex nest in sand-filled *Trigonephrus* shell) [AMG].

Geographic distribution.—*Quartinia refugicola* is known from Namibia, from numerous localities in the Desert and Succulent Steppe (Winter Rainfall Region) of Gess (1971) and from the immediately adjacent area across the Orange River in the Northern Cape of South Africa. It occurs together with *Q. conchicola*, *Q. obibensis* and *Q. vexillata*.

Floral associations.—Known in association with Aizoaceae: Mesembryanthema (*Phyllobolus*), Asteraceae (*Cotula*, *Dimorphotheca*, *Filicia*, *Foveolina*, *Hirpicium*, *Leysera*, *Osteospermum* and *Pteronia*), Geraniaceae (*Sarcocaulon*), Neuradaceae (*Grielum*) and Zygophyllaceae (*Zygophyllum*).

Nesting.—Throughout its presently known distributional area most commonly found nesting in sand-filled shells of the desert snail *Trigonephrus* sp. (Mollusca: Gasteropoda: Pulmonata: Dorcasiidae), less commonly in sand-filled cavities in calcrete rocks. See also Gess and Gess (1999). At several localities in the Sperrgebiet nests have been found to be parasitised by *Apolysis hesseana* Evenhuis and Greathead (Bombyliidae: Usiinae: Apolysini). See also Greathead (1999:155; 2006: 5).

Quartinia vexillata Gess, new species

Diagnosis.—Large to very large (5.2–6.5 mm). Fore wing with Cu1a and 2*m-cu* complete and as thick as other veins. Both sexes with vertex behind posterior ocelli evenly convex; with fore coxa swollen basally and anteriorly produced, very markedly so in male, less so in female where swelling, however, forms a rounded right angle. Male with fore femur greatly enlarged, robust, proximally produced ventrally to form a sturdy, subquadrate flange, distally markedly downcurved; flange with its posteriorly facing surface markedly concave with pronounced distal angles and its anteriorly facing surface convex with a pronounced submedian distal tubercle; tibia robust with dense setae on lower surface.

Description.—*Female:* In general facies similar to male (described below) but with legs and last tergum simple. Head without any pale markings. Specimens from between Alexander Bay and Port Nolloth have the mesosoma and gaster with both yellowish white and reddish brown markings very similar to those of males from the same population; specimens from SSE of Grilental and from Obib have the markings on the mesosoma tending to reddish brown. Microsculpture (shagreening) of head and mesosoma somewhat coarser and these parts, in particular mesoscutum, semi-matt rather than shiny.

Length 5.8–6.5 mm (average of 7 = 6.1 mm); length of fore wing 3.9–4.4 mm (average of 7 = 4.1 mm); hamuli 6.

Head broad, 1.33 × as wide as long; POL:OOL = 1:0.5. Vertex behind posterior ocelli evenly convex. Fore coxa enlarged, basally markedly and roundly anteriorly produced.

Male: Head and mesosoma black, gaster and greater part of femur of all legs very dark brown to almost black. The following are yellowish white: lower aspect of scape (excluding radicle) and pedicel; labrum (in one specimen testaceous); clypeus (other than for irregular area below antennal socket); a small transverse spot situated on either side of midline of frons immediately above frontoclypeal suture (in one specimen only); narrow paraocular streak from mandibular insertion to level of top of antennal socket; short (in one specimen almost medially interrupted) and laterally widening transverse band on dorsum of pronotum and minute spot at postero-dorsal angle of same; humeral streak of varying length; anterior and posterior thirds of tegula (median third clear, testaceous); medially interrupted band on lamellate margin of scutellum; distal portion of flange on fore femur. The following are various shades of light reddish-brown: mandible (other than base); flagellomeres (other than for dark suffusion on upper

surface); posterior bands (slightly widened medially, narrowed laterally, and not quite attaining lateral margins of terga) on terga I–VI; streak on anteriorly protruding portion of fore coxa (in one specimen) and lower surface of middle and hind coxae; all trochanters; distal portion (up to almost half the length) of anterior aspect of fore femur; basal flattened lower surface of middle femur; apex of middle and hind femora; tibia and tarsus of all legs. Venation light brown at base of wings, otherwise very dark brown. Wing membrane very slightly browned, a little darker on fore wing in and beyond marginal cell.

Length 5.2–6.4 mm; length of fore wing 3.6–3.8 mm; hamuli 6.

Head, mesosoma and terga I–VI very finely microsculptured (shagreened) but nevertheless shiny, with moderately sized punctures; punctures on head and terga somewhat shallow and undefined with interspaces generally less than puncture diameter, those on mesosoma deeper and well defined with interspaces at least on mesoscutum often greater than puncture diameter. Tergum VII without microsculpture; punctures more pronounced than those on other terga, irregularly spaced, some separated by wide interspaces and others coalescing.

Setation on head and particularly on body sparse and short throughout, more noticeable on tibiae and tarsi and strikingly developed on underside of front tibia where dense and long.

Head broad, 1.45 × as wide as long; POL:OOL = 1:0.5. Vertex behind posterior ocelli evenly convex;

Tegula with posterior inner corner inwardly produced. Wing venation with *Cu*_{1a} and *2m-cu* complete and as thick as other veins.

Fore leg uniquely and greatly modified; coxa enlarged, basally markedly and roundly anteriorly produced; femur (Fig. 4) greatly enlarged, robust, proximally produced ventrally to form a sturdy,

subquadrate flange, distally markedly downcurved; flange with its posteriorly facing surface markedly concave with pronounced distal angles and its anteriorly facing surface convex with a pronounced submedian distal tubercle; tibia robust with dense setae on lower surface.

Middle and hind femora robust, markedly angled below and with lower surface both proximal and distal to angle distinctly flattened (more so on middle than on hind femur).

Tergum VII (Fig. 12) in posterior half with dorsal surface raised laterally and slightly concave medially, produced apically and with a deep, narrow, slightly subparallel-sided median slit.

Etymology.—The name *vexillata* is formed from the Latin noun *vexillum* meaning a flag or standard. It refers to the conspicuously modified front femur of the male which may possibly have a communicatory role in courtship behaviour.

Material examined.—Holotype: ♂, SOUTH AFRICA: NORTHERN CAPE: 23 km S of Alexander Bay (28.46S 16.37E), 11.x. 2000 (F. W. and S. K. Gess) (on ground) [AMG]. Paratypes: NAMIBIA: Sperrgebiet, main north/south road, 47 km SSE of Grillental (27.23S 15.32E), 6.ix.2002 (F. W. and S. K. Gess), 2 ♀♀ (on ground next to *Drosanthemum* sp., Aizoaceae: Mesembryanthema) [AMG]; Sperrgebiet, Obib camp site (28.00S 16.39E), 14.ix.2003 (F. W. and S. K. Gess), 9 ♀♀ (7 ♀♀ visiting yellow flowers of *Cephalophyllum* sp., Aizoaceae: Mesembryanthema; 2 ♀♀ visiting yellow flowers of *Othonna cylindrica* (Lam.) DC., Asteraceae) [AMG]. SOUTH AFRICA: NORTHERN CAPE: 23 km S of Alexander Bay (28.46S 16.37E), 11.x. 2000 (F. W. and S. K. Gess), 5 ♀♀ (4 ♀♀ visiting pink flowers of *Drosanthemum* sp., Aizoaceae: Mesembryanthema; 1 ♀ visiting purple-centred white flowers, Aizoaceae: Mesembryanthema) [AMG]; 60 km N of Port Nolloth (28.47S 16.38E), 27. ix. 1997) F. W. and S. K. Gess), 6 ♀♀, 1 ♂ (2 ♀♀, ♂ visiting pale pink flowers of *Drosanthemum* sp.; 4 ♀♀ on ground) [AMG].

Geographic distribution.—The species is known from Namibia from the Desert

and Succulent Steppe (Winter rainfall area) of Giess (1971) and from South Africa from the adjoining northern Strandveld of the West Coast of Acocks (1953). It occurs variously together with *Q. conchicola*, *Q. obibensis* and *Q. refugicola*.

Floral associations.—Aizoaceae: Mesembryanthema (*Cephalophyllum*, *Drosanthemum*); Asteraceae (*Othonna*).

Nesting.—Unknown; probably utilizing sand-filled snail shells as a nesting niche.

Discussion.—See under *Q. conchicola*.

KEY TO SPECIES NESTING IN SAND-FILLED SNAIL SHELLS OR (*VEXILLATA*)
PRESUMED TO DO SO

Males

- | | | |
|----|---|--------------------------------|
| 1. | Fore legs not modified | 2 |
| - | Fore legs markedly modified | 5 |
| 2. | Sternum I not modified | 3 |
| - | Sternum I posteriorly raised into a tubercle | 4 |
| 3. | Large (5.0–5.4 mm long); black with white markings; tegula with white anterior and posterior markings contrasting markedly with dark brown to black median part; pale posterior bands on terga not extending onto sides; clypeus and labrum white | <i>australis</i> Gess n. sp. |
| - | Medium (4.1–4.3 mm long); black with yellow to brownish-yellow markings; tegula with pale anterior and posterior markings not contrasting markedly with testaceous median part; pale posterior bands on terga reaching lateral margins | <i>refugicola</i> Gess n. sp. |
| 4. | Clypeus convex | <i>namaqua</i> Gess n. sp. |
| - | Clypeus depressed to concave | <i>obibensis</i> Gess n. sp. |
| 5. | Posterior bands on terga white; not contrasting in colour with markings on head and mesosoma; fore femur (Fig. 3) greatly swollen, its posterior surface in proximal half markedly concavely excavate, smooth and very shiny, its baso-ventral region angulate and sublamellate | <i>namaquensis</i> Gess n. sp. |
| - | Posterior bands on terga reddish-brown or bright reddish-orange, in most specimens contrasting in colour with markings on head and mesosoma; fore femur differently formed | 6 |
| 6. | Tibiae and tarsi of all legs predominantly black; fore femur (Fig. 1) greatly swollen, postero-basally with a pointed tubercle, its posterior surface depressed, smooth and very shiny and forming an angle with ventral surface | <i>bonaespei</i> Gess sp. n. |
| - | Tibiae and tarsi of all legs predominantly light reddish-brown | 7 |
| 7. | Vertex behind posterior ocelli evenly convex; fore coxa swollen basally and markedly anteriorly produced; fore femur (Fig. 4) greatly enlarged, robust, proximally produced ventrally to form a sturdy subquadrate flange, distally markedly downcurved; flange with its posterior facing surface markedly concave with pronounced distal angles and its anterior facing surface convex with a pronounced submedian distal tubercle | <i>vexillata</i> Gess n. sp. |
| - | Vertex behind posterior ocelli depressed, somewhat concave; fore coxae unmodified; fore femur (Fig. 2) enlarged, excavated beneath and undulate postero-ventrally | <i>conchicola</i> Gess n. sp. |

Females

Species not included: *namaquensis* Gess n. sp. (♀ not known)

- | | | |
|----|---|---|
| 1. | Markings on mesosoma and gaster generally concolorous | 2 |
|----|---|---|

- Markings on mesosoma and gaster not of same colour; posterior bands on terga reddish-brown or bright reddish-orange, generally contrasting with pale markings on mesosoma 5
- 2. Black with white markings; tegula with anterior and posterior markings contrasting markedly with dark brown to black median part; posterior bands on terga not extending onto sides *australis* Gess sp. n.
- Black with yellow, brownish-yellow or reddish-brown markings; tegula with anterior and posterior markings not contrasting markedly with median part; posterior bands on terga variously developed 3
- 3. Posterior bands on terga reaching lateral margins; scutellar disk black and scutellar lamella yellow to brownish yellow *refugicola* Gess sp.n.
- Without this combination of characters 4
- 4. Mesoscutum and scutellum with interstices between punctures not obviously microreticulate (shagreened); scutellar disk and scutellar lamella black; scutellar lamella at most slightly flattened postero-medially; metanotum not transversely impressed, black throughout *namaqua* Gess n. sp.
- Mesoscutum and scutellum with interstices between punctures very obviously microreticulate (shagreened); scutellar disk laterally and medially with reddish-brown markings and scutellar lamella of same colour; scutellar lamella slightly emarginate postero-medially; metanotum transversely impressed with lower section reddish brown and contrasting with almost black upper section *obibensis* Gess n. sp.
- 5. Tibiae and tarsi of all legs predominantly black *bonaespei* Gess sp. n.
- Tibiae and tarsi of all legs predominantly light reddish-brown 6
- 6. Vertex behind posterior ocelli evenly convex; fore coxae swollen basally and markedly anteriorly produced *vepillata* Gess n. sp.
- Vertex behind posterior ocelli depressed, somewhat concave; fore coxae unmodified *conchicola* Gess n. sp.

B) Other species

Quartinia femorata Gess, new species

Diagnosis.—Very large to gigantic (5.8–6.7 mm long). Fore wing with Cu1a and 2*m-cu* complete and as thick as the other veins. Tegula with posterior inner corner inwardly produced. Both sexes predominantly yellow. Male fore femur robust, notched ventrally in basal third and with a distally directed, apically rounded, lamellate process.

Description.—*Female:* Predominantly yellow. Black greatly reduced leaving only: occiput; irregular median band on vertex (posteriorly wide along occipital carina but anteriorly narrowed and closely encompassing ocelli) and on frons (on upper half of similar width to part encompassing ocelli but on lower half trifold with middle

arm and outcurved lateral arms reaching clypeal suture and antennal sockets respectively); propleuron (in greater part and prosternum; median and parapsidal bands on mesoscutum (median band wide at anterior margin, narrowing posteriorly; parapsidal bands not reaching anterior margin and of even width throughout); small antero-median mark on scutellum; anterior half of propodeal dorsum and small spot on each side at bottom of propodeal declivity; transverse marking (either continuous or broken up into three) on declivity of tergum I; abbreviated anterior transverse bands (only visible if metasoma is downwardly flexed) on terga II and III. The following are various shades of light reddish-brown: mandibular teeth; antennal club (apex of last flagellomere dark brown); last one or two tarsomeres

(arolia dark brown); usually concealed anterior third of terga II–VI and poorly defined laterally abbreviated and medially interrupted pre-apical transverse bands on terga II–V. Tegulae yellowish-white except for unpigmented translucent central area and outer margin. Wing membrane hyaline; costa, subcosta, media, thickening at junction of Rs & M, parastigma and stigma light brown, rest of venation contrastingly dark brown.

Length 5.8–6.7 mm (average of 6:6.3 mm; length of front wing 3.8–4.3 mm (average of 6:4.1 mm); hamuli 7.

Head, thorax and gaster sparsely covered with short, semi-erect pale pilosity, slightly longer and most noticeable on head, declivity of propodeum, declivity of tergum I, and sternum VI.

Head in front view $1.25 \times$ as wide as long, microreticulate, with close, fine, shallow punctures on vertex. POL:OOL = 1:0.6. Clypeus $1.2 \times$ as wide as long. Mandible simple, apically strongly bidentate.

Thorax microreticulate; mesoscutum and scutellum with only scattered, inconspicuous, very shallow, small punctures; pronotum and mesopleuron with conspicuous, moderate-sized, shallow punctures. Tegula $1.5 \times$ as long as wide, the posterior inner corner distinctly inwardly produced. Propodeal angles evenly rounded.

Gaster microreticulate and with fine punctures.

Male: Coloration as in female. Parameres light reddish-brown.

Length 5.9–6.3 mm; length of fore wing 3.6–4.3; hamuli 7.

Structurally similar to female but differing in the following respects: fore femur (Fig. 5) considerably more robust, notched ventrally in basal third and with distally directed, apically rounded, lamellate process; tergum VII (Fig. 13) with surface flattened medially, with hind margin widely rounded and medially deeply and narrowly emarginate; sternum VII with surface convex medially, concave laterally,

with apical margin widely trilobed, lateral lobes ventrally curved. Genitalia very large (1.5 mm long; i.e. half the length of the gaster); outer ramus of parameres broad in dorsal view, apically obliquely truncate and densely covered with fine, long setae; inner ramus proximally of varying width and distally progressively narrowing and markedly and evenly downcurved to form a sharp, well sclerotized hook attaining level of lateral posterior angle of outer ramus.

Etymology.—The name *femorata* serves to draw attention to the uniquely modified front femur of the male.

Material examined.—Holotype: ♂, NAMIBIA: 11 km S of Swakopmund on inland side of road B2 to Walvis Bay (22.46S 14.32E), 7.iv.2002 (F. W. and S. K. Gess) [AMG]. Paratypes: NAMIBIA: same data as holotype, 6 ♀♀, 13 ♂♂ [AMG]; same data as holotype but date 14.iv.2002, 1 ♀, 2 ♂♂ [AMG]; same data as holotype but date 20.iv.2002, 1 ♀, 4 ♂♂ [AMG]; same data as holotype but date 30.iii.2004, 1 ♀, 2 ♂♂ [AMG]; same data as holotype but date 31.iii.2004 [AMG], 1 ♀ [AMG]; Walvis Bay, 22.ii.1990 (W. J. Pulawski), 6 ♀♀, 2 ♂♂ [CAS]. (All specimens collected by F. W. and S. K. Gess were visiting the pink flowers of *Trianthema hereroensis* Schinz (Aizoaceae: non-Mesembryanthema) or were on the sand immediately next to these plants where resting or mating.)

Geographic distribution.—*Q. femorata* is known only from Namibia, from a single locality on the seaward side of the coastal dunes at the northern extremity of the Southern Namib of Giess (1971).

Floral associations.—*Q. femorata* has consistently been found to be associated solely with *Trianthema hereroensis* Schinz (Aizoaceae: non-Mesembryanthema).

Nesting.—Unknown; probably in the sand beneath the hummock forming *Trianthema* bushes.

Quartinia geigeriae Gess, new species

Diagnosis.—Medium sized to large (3.8–5.0 mm). Fore wing with Cula and *2m-cu* complete and as thick as other veins. Tegula short, laterally rounded, with pos-

terior inner corner a near right angle. Both sexes with angles of propodeum very markedly posteriorly produced, lamellate and subhyaline. Female with head and mesosoma black, tegulae and gaster reddish brown. Male with head, mesosoma and gaster black with yellowish-white markings.

Description.—*Female:* Black. The following are various shades of reddish brown: labrum; distal two thirds of mandibles; tegula; scutellar lamella; median section of metanotum; in some specimens a narrow streak dorsally on outer aspect of lamellate propodeal angle (rest of lamella subhyaline); terga I–IV or V (narrow posterior bands lighter in colour than rest of terga). Underside of antenna, distal quarter of femur, entire tibia and all tarsomeres of all legs light reddish yellow. Wings hyaline; veins brown.

Length 4.6–5.0 mm (average of 6:4.8 mm); length of fore wing 2.7–3.0 (average of 6:2.9 mm); hamuli 5; length of extended tongue 3.1–3.2 mm.

Head in front view $1.23 \times$ as wide as long, microreticulate but shiny, with separated, moderate sized punctures. PO:L:OOL = 1:0.85. Clypeus $1.6 \times$ as wide as long (length measured to bottom of emargination; $1.36 \times$ if measured to level of antero-lateral angles), markedly raised anteriorly and laterally, a little flattened medially; anterior margin deeply and evenly emarginate; antero-lateral angles narrowly rounded, lamellate, subhyaline.

Mesosoma microreticulate but shiny; mesonotum and scutellum with punctures slightly larger and sparser than on head; pronotum with punctures similar to those on head; mesopleuron with punctures close together, reticulate-punctate ventrally. Propodeum dorso-laterally markedly raised, dorso-medially depressed to expose metanotum, posteriorly with upper three quarters flat, closely reticulate-punctate and lower quarter unpunctured and shiny, laterally with a smooth, shiny depression and arising from it a very pronounced

posteriorly directed lamella; lamella flat, very thin, subhyaline, basally slightly rugose but elsewhere smooth, marginally widely and evenly rounded.

Gaster microreticulate but shiny; punctures finer and shallower than on head and mesosoma, becoming progressively finer posteriorly.

Vestiture generally very short and sparse, longer and more noticeable on labrum, posterior flat surface of propodeum and declivous anterior face of tergum I.

Male: Black. The following are yellowish-white: base of labrum (in some specimens only); clypeal disk and adjoining it a large medial marking on frons together forming an hour-glass-like figure); scape, pedicel and proximal flagellomeres; anterior margin of pronotum (transverse band in some specimens medially interrupted and reduced to two spots); tegula (except for pale testaceous discal spot); in some specimens a narrow streak dorsally on outer aspect of lamellate propodeal angle (rest of lamella subhyaline); narrow posterior bands on terga I–VI (very narrowly anteriorly widened medially on II–VI; immediate vicinity of emargination of tergum VII); distal quarter of femur, entire tibia and all tarsomeres of all legs. Varyingly reddish brown are: mandible distally; concave declivous anterior surface of tergum I. Underside of antennal club light reddish, upper side brown. Wings hyaline; veins brown.

Length 3.8–4.5 mm (average of 6:4.1 mm); length of front wing 2.4–2.8 mm (average of 5:2.6 mm); hamuli 4–5.

Structurally very similar to female but puncturation on gaster noticeably coarser. Tergum VII reticulate punctate, postero-medially with a shallow V-shaped emargination. Parameres postero-laterally smoothly curved to apex; apex not hooked and inner edge of parameres not toothed. Labrum shiny, non-carinate. Antenna with poorly defined, elongate club.

Etymology.—The name *geigeriae*, genitive singular, is formed from the generic name

of the plants, *Geigeria* spp. (Asteraceae), on the capitula of which the wasp was found foraging for nectar or nectar and pollen.

Material examined.—Holotype: ♀, NAMIBIA: Solitaire (23.52S 16.00E), 30.iv.2002 F. W. and S. K. Gess) (visiting yellow flowers of *Geigeria ornativa* O. Hoffm., Asteraceae) [AMG]. Paratypes: NAMIBIA: same data as holotype, 2 ♀♀, 6 ♂♂ [AMG]; between Solitaire and Nomtsas (24.15S 16.33E), 1.v.2002 (F. W. and S. K. Gess), 10 ♀♀, 2 ♂♂ (9 ♀♀, 1 ♂ visiting yellow flowers of *Geigeria ornativa*; 1 ♀, 1 ♂ visiting yellow flowers of *Geigeria pectidea* (DC.) Harv.) [AMG]; 1 km N of Mariental (24.37S 17.58E), 2.v.2002 (F. W. and S. K. Gess), 30 ♀♀, 4 ♂♂ (22 ♀♀, 2 ♂♂ visiting yellow flowers of *Geigeria ornativa*; 8 ♀♀, 2 ♂♂ visiting yellow flowers of *Geigeria pectidea*) [AMG]; between Mariental and Keetmanshoop (24.54S 17.55E), 2.v.2002 (F. W. and S. K. Gess), 1 ♂ (visiting yellow flowers of *Geigeria pectidea*) [AMG]; 18 km from Ariamsvlei on road to Aroab [28.00S 19.43E], 14.v.1973 (C. F. Jacot-Guillarmod), 5 ♀♀, 1 ♂ [AMG]; SOUTH AFRICA: NORTHERN CAPE: Langvlei, 103 km WNW of Upington [28.10S 20.16E], 14.v.1973 (C. F. Jacot-Guillarmod), 21 ♀♀, 2 ♂♂ [AMG].

Geographic distribution.—*Q. geigeriae* is known from Namibia, from a limited area in the Semi-desert and Savanna Transition (Escarpment Zone) and the adjoining Dwarf Shrub Savanna of Giess (1971), and from a closely adjoining locality in the Northern Cape.

Floral associations.—Known only in association with two species of *Geigeria*, Asteraceae).

Nesting.—Unknown.

Discussion.—*Q. geigeriae* shares with *Q. artemis* Richards, *Q. breyeri* Richards and the below described *Q. lamellata* the possession of markedly backwardly produced propodeal lamellae. *Q. geigeriae* together with *breyeri* and *lamellata* is readily distinguished from *artemis* in having the posterior inner corner of the tegula rounded or a near right angle, not markedly produced inwards; it is distinguished from both *breyeri* and *lamellata* in having the epicnemium rounded, not defined by a low carina.

Quartinia lamellata Gess, new species

Diagnosis.—Large to very large (5.0–6.2 mm). Fore wing with *Cu*_{1a} and *2m-cu* complete and as thick as other veins. Clypeus raised and protruding with, especially in female, marked disto-lateral lobes. Labrum large, very noticeable, in female setose. Epicnemium defined by a low carina. Tegula rounded posteriorly, with posterior inner corner a near right angle. Angles of propodeum markedly backwardly produced, lamellate.

Description.—*Female*: Black. The following are yellowish-white: in some specimens a small spot on disto-lateral lobe of clypeus; transversely oval or bilobed medial marking (in some specimens reduced to two round spots) distally on frons immediately above clypeus; in a single specimen a small round spot in ocular sinus; broad streak behind top of eye; scape (distally), pedicel, intermediate flagellomeres, and underside of antennal club; pair of spots on dorsum of pronotum; large mark on humeral angle (in some specimens remote from spots on dorsum, in others fused with them to form a continuous band); variously developed streak on postero-dorsal angle of pronotum; in some specimens a small spot on mesopleuron; tegula (except for testaceous median area); in some specimens a small streak laterally (flanking tegula) on mesonotum; curved posterior band on disk of scutellum; angles of propodeum; posterior bands, reaching sides and generally slightly expanded medially and laterally, on terga I–V; apical half of tergum VI; postero-lateral corners of sterna II–V and apical half or more of sternum VI; distal half or less of femur, entire tibia and tarsus of all legs. Mandibles, labrum and suffusion on upper surface of antennal club reddish-brown. Wing membrane hyaline; veins brown.

Length 6.0–6.2 mm (average of 3:6.06 mm); length of fore wing 3.9–4.08 mm (average of 3:4.0 mm); hamuli 4.

Head in front view $1.21 \times$ as wide as long. POL:OOL = 1:0.83

Clypeus raised and protruding, medially depressed, distally widely and deeply emarginate and with marked disto-lateral lobes. Labrum large, longer than wide, apically pointed, setose. Clypeus and frons moderately shiny, with close, fairly coarse punctures and finely microsculptured interstices; pronotum, mesoscutum and scutellum with larger, much more sparsely arranged punctures and extremely finely microsculptured interstices; terga uniformly finely punctured. Epicnemium defined by a low carina. Tegula rounded posteriorly. Angles of propodeum markedly backwardly produced, at mid-height forming a rounded projection and below that translucently lamellate.

Male: Black. The following are yellow: clypeus (other than for, in some specimens including holotype, a variously sized median longitudinal marking and in all specimens areas immediately adjacent to antennal sockets); large transverse marking distally on frons immediately above clypeus; broad streak behind top of eye; scape (distally), pedicel, intermediate flagellomeres, and underside of antennal club; most or almost entire dorsal surface of pronotum (except in all specimens small postero-lateral area flanking tegula); spot on mesopleuron; tegula (except for testaceous median area); in all specimens a marking (ranging from a minute spot to a small streak) flanking tegula on mesonotum; curved posterior band on disk of scutellum; scutellar lamella; angles of propodeum; posterior bands (anteriorly ill-defined and grading into reddish-brown), reaching sides on terga I–VI and, to a varying degree, apical half of tergum VII; ill-defined posterior bands on sterna II–VI; most of sternum VII; distal half or less of femur, entire tibia and tarsus of all legs. Mandibles (wholly or in part), labrum and suffusion on upper surface of antennal club, terga and sterna anterior to posterior

bands reddish-brown. Wing membrane hyaline; veins brown.

Length 5.0–5.8 (average of 3:5.2 mm; holotype 5.0 mm); length of fore wing 3.0 mm. Head in front view $1.24 \times$ as wide as long

Structurally very similar to female but puncturation on head and mesosoma markedly coarser. Tergum VII with hind margin shallowly emarginate and postero-lateral lobes rounded.

Etymology.—The name *lamellata* is intended to draw attention to the markedly backwardly produced, lamellate angles of the propodeum.

Material examined.—Holotype: ♂, NAMIBIA, Rooibank [23.11S 14.39E], 19.xii.1978 (H. Empey) [AMG]. Paratypes: NAMIBIA: same data as holotype but date 28.xii.1978, 2 ♂♂ [AMG]; Kaokoland [Dist.], Otjinungwa (SE 1712 Ab) [17.17S 12.27E], 19–22.viii.1973 (? collector), 1 ♀ [NNIC]; Kaokoland [Dist.], Khwarib R. (SE 1914 Ac) [locality not pinpointed], 17–19.v.1978 (S. Louw, M.-L. Penrith), 1 ♂ [NNIC]; Namib Naukluft Park, Vogelfederberg (23.03S 15.00E), 21.ii.1988 (G. D. Butler), 1 ♀ [NCP]; same locality, 24.i.1988 (R. Miller and L. Stange), 1 ♀ [FSCA]; Lüderitz [Dist.], Sossusvlei (SE 2415 Cd) [24.43S 15.20E], 12–19.ix.1971 (? collector), 3 ♀♀ [NNIC]; Lüderitz [Dist.], Kanaän 104 (SE 2516 Cc) [25.50S 16.09E], 6–7.x.1972 (? collector), 10 ♀♀ [NNIC];

Geographic distribution.—*Quartinia lamellata* is widespread in the western parts of Namibia, collection localities spanning eight degrees of latitude and falling in the Mopane Savanna, Central Namib and Southern Namib/Semi-desert and Savanna Transition (Escarpment Zone) of Giess (1971).

Floral associations.—Unknown.

Nesting.—Unknown.

Discussion.—See discussion under *geigeriae*. On the basis of the characters there listed, *lamellata* is closest to *breyeri* but may readily be distinguished from that species by its larger size, differently developed clypeus and labrum, differences in puncturation and in colour pattern.

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